



Gamsby and Mannerow



**FUNCTIONAL SERVICING REPORT
SEWER AND WATER
HANOVER HABITAT FOR HUMANITY
TOWN OF HANOVER
FEBRUARY 2011
Our File: 209019**

Habitat for Humanity proposes to construct eight (8) semi-detached residential dwellings along with an access road, driveways for each unit, and associated landscaping areas at 357 – 14th Street in the Town of Hanover, also known as Part of Lots 53 to 62, Registered Plan 730 and Part of Lots 5 and 11, Registered Plan 750, Reference Plan 16R-9607.

The site is located mid-block between 10th Avenue and 11th Avenue with access from 14th Street. The site is bounded by 14th Street to the north and residential property to the east, south and west. The 0.36 ha site is currently a grassed area with trees and bushes along the east and west property lines.

The site is serviced by municipal water and sewer systems on 14th Street. About 2008, 14th Street was reconstructed by the Town, at which time a 150mmØ water service and a 150mmØ sanitary sewer service were installed from the mains to the property line.

The proposed sanitary building sewers and private sewer are planned as follows:

Assuming 1 bathroom group, kitchen and clothes washer per unit, each unit would have 9 fixture units, with the flows per unit about 20 gal/min (1.5L/s). Individual 100mmØ sanitary building sewers are proposed at 1.0% grade, which can accommodate up to 180 fixture units. The private sewer provides connection from the individual sanitary building sewers to the municipal sewer. The 8 units would have a total fixture units of 72, with a total flow rate of about 160 gal/min (12 L/s). The proposed 150mmØ sanitary sewer at 0.5% has a capacity of 18 L/s. The municipal sewer on 14th Street is a 200mmØ at 3.0% with no other known connections, which has a capacity of 57 L/s.

The 150mmØ water service line is adequate to convey fire flows to the proposed on-site hydrant. 20mmØ copper water services would provide domestic flows from the 150mmØ main to the individual residences.

Respectively submitted,

GAMSBY AND MANNEROW LIMITED

Per:

J. B. Slocombe, P.Eng.

JBS/ah

people engineering environments

Gamsby and Mannerow Limited • Guelph, Owen Sound, Listowel, Kitchener, Exeter

1260 – 2nd Avenue, E., Unit 1 Owen Sound, ON N4K 2J3 519-376-1805 fax 519-376-8977 www.gamsby.com

Table 7.4.9.3.
Minimum Permitted Size of Fixture Outlet Pipe and Hydraulic Loads for Fixtures
Forming Part of Sentence 7.4.9.3.(1) and 7.4.10.2.(1)

<i>Fixture</i>	<i>Minimum Size of Fixture Outlet Pipe, in.</i>	<i>Hydraulic Load, fixture units</i>
Autopsy table	1½	2
Bathroom group		
(a) with flush tank		6
(b) with direct flush valve		8
Bathtub (with or without shower)	1½	1½
Bath: foot, sitz or slab	1½	1½
Bed pan washer	3	6
Beer cabinet	1½	1½
Bidet	1¼	1
Chinese range	1½	3
Clothes washer		
(a) domestic	N/A	1½ with 1½ in. trap
(b) commercial	N/A	2 with 1½ in. trap
Cup sinks	1¼	½
Dental unit or cuspidor	1¼	1
Dishwasher		
(a) domestic	1½	1 (no load if connected to garbage grinder or domestic sink)
(b) commercial type	2	3
Drinking fountain	1¼	½
Fish tank or tray	1½	1½
Floor drain	2	2 with 2 in. trap 3 with 3 in. trap
Garbage grinder, commercial type	2	3
Icebox	1¼	1
Laundry tray		
(a) single or double units or 2 single units with common trap	1½	1½
(b) 3 compartments	1½	2
Column 1	2	3

Table 7.4.9.3. (Cont'd)
Minimum Permitted Size of Fixture Outlet Pipe and Hydraulic Loads for Fixtures
 Forming Part of Sentence 7.4.9.3.(1) and 7.4.10.2.(1)

<i>Fixture</i>	<i>Min. Size of Fixture Outlet Pipe, in.</i>	<i>Hydraulic Load, fixture units</i>
Lavatory		
(a) barber or beauty parlor	1½	1½
(b) dental	1¼	1
(c) domestic type single, or 2 single with common trap	1¼	1 with 1¼ in. trap
		1½ with 1½ in. trap
(d) multiple or industrial type	1½	3
Macerating Toilet System for single bathroom	See Sentence 7.4.9.2.(4)	4
Potato Peeler	2	3
Shower drain		
(a) from 1 head	1½	1½
(b) from 2 or 3 heads	2	3
(c) from 4 to 6 heads	3	6
Sink		
(a) domestic and other small type with or without garbage grinders, single, double or 2 single with a common trap	1½	1½
(b) other sinks	1½	1½ with 1½ in. trap
		2 with 2 in. trap
		3 with 3 in. trap
Urinal		
(a) pedestal, siphon jet or blowout type	2	4
(b) stall, washout type	2	2
(c) wall		
(i) washout type	1½	1½
(ii) other types	2	3
Water closet		
(a) with flush tank	3	4
(b) with direct flush	3	6
Column 1	2	3

9 FU.

Table 7.4.10.5.
Maximum Probable Drainage Rate, gal/min
 Forming Part of Sentences 7.4.10.3.(1), 7.4.10.5.(2)

<i>Fixture Units in Service</i>	<i>Fixture Units</i> Col. 1	<i>Fixture Units</i> Col. 1 x 10	<i>Fixture Units</i> Col. 1 x 100
100	53	174	900
90	51	164	835
80	49	153	750
70	47	140	680
60	44	128	600
50	41	115	520
40	38	102	435
30	33	88	350
20	27	72	262
10	21	53	174
Column 1	2	3	4

7.4.10.6. Hydraulic Loads to Soil or Waste Pipes

(1) Except as provided in Sentences (2) and (4), the hydraulic load that is drained to every *soil or waste stack* shall conform to Table 7.4.10.6.A.

Table 7.4.10.6.A.
Maximum Permitted Hydraulic Load Drained to Soil-or-Waste Stack
 Forming Part of Sentence 7.4.10.6.(1)

<i>Pipe Size, in.</i>	<i>Maximum Hydraulic Load, fixture units</i>	<i>Maximum Fixture Units Drained from any one Storey</i>
1¼	2	2
1½	8	5
2	24	10
3	102	18
4	540	100
5	1 400	250
6	2 900	500
8	7 600	830
10	15 000	2 700
12	26 000	4 680
15	50 000	9 000
Column 1	2	3

Table 7.4.10.8.
Maximum Permitted Hydraulic Load Drained to a Horizontal Sanitary Drainage Pipe
Forming Part of Sentences 7.4.10.3.(1), 7.4.10.6.(2) and 7.4.10.8.(1)

Drain Size, Nominal in.	Maximum Hydraulic Load, <i>fixture units</i>					
	Slope ⁽¹⁾					
	1:400	1:200	1:133	1:100	1:50	1:25
3	---	---	---	---	27	36
4	---	---	---	180	240	300
5	---	---	380	390	480	670
6	---	---	600	700	840	1 300
8	---	1 400	1 500	1 600	2 250	3 370
10	---	2 500	2 700	3 000	4 500	6 500
12	2 240	3 900	4 500	5 400	8 300	13 000
15	4 800	7 000	9 300	10 400	16 300	22 500
Column 1	2	3	4	5	6	7

Notes to Table 7.4.10.8.:

(1) Slope is the ratio of rise to run, in whatever measurement units are chosen.

7.4.10.9. Hydraulic Loads on Horizontal Storm Drains

(1) The hydraulic load that is drained to a horizontal *storm drainage pipe* shall conform to Table 7.4.10.9., based on the *size* and slope.

Table 7.4.10.9.
Maximum Permitted Hydraulic Load Drained to a Horizontal Storm Drainage Pipe
Forming Part of Sentences 7.4.10.9.(1) and 7.4.10.10.(2)

Size of Drain or Sewer, in.	Maximum Hydraulic Load, L						
	Slope ⁽¹⁾						
	1 in 400	1 in 200	1 in 133	1 in 100	1 in 68	1 in 50	1 in 25
3	-----	-----	-----	-----	2 390	2 770	3 910
4	-----	-----	-----	4 220	5 160	5 970	8 430
5	-----	-----	6 760	7 650	9 350	10 800	15 300
6	-----	-----	10 700	12 400	15 200	17 600	24 900
8	-----	18 900	23 200	26 700	32 800	37 800	53 600
10	-----	34 300	41 900	48 500	59 400	68 600	97 000
12	37 400	55 900	68 300	78 700	96 500	112 000	158 000
15	71 400	101 000	124 000	143 000	175 000	202 000	287 000
Column 1	2	3	4	5	6	7	8

Notes to Table 7.4.10.9.:

(1) Slope is the ratio of rise to run, in whatever measurement units are chosen.